

AMENDMENTS TO THE SPECIFICATION

Please replace lines 10-19 of page 3 of the specification with the following paragraph:

As indicated in the Summary, in some respects, the invention is directed to solid compositions and method of forming such solid compositions. Such compositions include a solidification matrix having a binder agent, and optionally ~~includes~~ include additional functional ingredients or compositions. The functional ingredients or compositions can include conventional functional ~~agent~~ agents and other active ingredients that will vary according to the type of composition being manufactured in a solid matrix formed by the binding agent. Some embodiments are suitable for preparing a variety of solid cleaning compositions, as for example, a cast solid, a molded solid, an extruded solid, a formed solid, or the like. In at least some embodiments, the binding agent includes and/or is formed by HEDTA and water:

Please replace lines 20-31 of page 3 and 1-2 of page 4 of the specification with the following paragraph:

It has been discovered that in at least some embodiments, HEDTA and water can be combined to form a solid binding agent. While not wishing to be bound by theory, it is believed that in at least some embodiments, the HEDTA and water may combine to form an HEDTA hydrate that can solidify and provide for a solid binding agent in which additional functional materials may be found to form a functional solid composition. In our experimentation with respect to the use of HEDTA and water to form a solid binding agent, evidence for the formation of a solid composition including a distinct species formed from HEDTA and water has been found. For example, as will be discussed further in the Examples set fourth below, a mixture of HEDTA and water alone can form a solid binding composition. Additionally, analysis of some embodiments through differential scanning calorimetry (DSC) indicates the formation of a solid binding agent including a distinct species formed with HEDTA and water. HEDTA is generally known as a water soluble chelating

agent, but has not been reported as a component in a binding agent for a solidification complex material.

Please replace lines 13-26 of page 4 of the specification with the following paragraph:

The binding agent can be used to form a solid composition including additional components or agents, such as additional functional material. As such, in some embodiments, the binding agent (including water and HEDTA) can provide only a very small amount of the total weight of the composition, or may provide a large amount, or even all of the total weight of the composition, for example, in embodiments having few or no additional functional materials disposed therein. For example, in some embodiments, the water used in creating the binding agent can be present in the composition in the range of up to about 20%, or in some embodiments, in the range of up to about 10%, or in the range of about 1 to about 8%, or in the range of about 2 to about 7% by weight of the total weight of the composition (binding agent plus any additional components). Additionally, in some embodiments, the HEDTA used in creating the binding agent can be present in the composition in range of up to about 93%, or in the range of about 5 to about 40%, or in the range of about 7.5% to about 25% by weight of the total weight of the composition (binding agent plus any additional components).

Please replace lines 8-17 of page 7 of the specification with the following paragraph:

The solid composition may optionally ~~includes~~ include one or more chelating /sequestering agent as a functional ingredient. A chelating/sequestering may include, for example an aminocarboxylic acid, a condensed phosphate, a phosphonate, a polyacrylate, and the like. In general, a chelating agent is a molecule capable of coordinating (i.e., binding) the metal ions commonly found in natural water to prevent the metal ions from interfering with the action of the other deterative ingredients of a cleaning composition. The chelating/sequestering agent may also function as a threshold agent when included in an effective amount. In some embodiments, a solid

cleaning composition can include in the range of up to about 70 wt. %, or in the range of about 5-60 wt. %, of a chelating/sequestering agent.

Please replace lines 13-19 of page 8 of the specification with the following paragraph:

Some examples of polymeric polycarboxylates suitable for use as sequestering agents include those having a pendant carboxylate ($-\text{CO}_2$) ~~groups~~ group and include, for example, polyacrylic acid, maleic/olefin copolymer, acrylic/maleic copolymer, polymethacrylic acid, acrylic acid-methacrylic acid copolymers, hydrolyzed polyacrylamide, hydrolyzed polymethacrylamide, hydrolyzed polyamide-methacrylamide copolymers, hydrolyzed polyacrylonitrile, hydrolyzed polymethacrylonitrile, hydrolyzed acrylonitrile-methacrylonitrile copolymers, and the like.

Please replace lines 5-19 of page 10 of the specification with the following paragraph:

Nonionic surfactants useful in cleaning compositions[[,]] include those having a polyalkylene oxide polymer as a portion of the surfactant molecule. Such nonionic surfactants include, for example, chlorine-, benzyl-, methyl-, ethyl-, propyl-, butyl- and other like alkyl-capped polyethylene glycol ethers of fatty alcohols; polyalkylene oxide free nonionics such as alkyl polyglycosides; sorbitan and sucrose esters and their ethoxylates; alkoxylated ethylene diamine; alcohol alkoxylates such as alcohol ethoxylate propoxylates, alcohol propoxylates, alcohol ethoxylate butoxylates, and the like, nonylphenol ethoxylate, polyoxyethylene glycol ethers and the like; carboxylic acid esters such as glycerol esters, polyoxyethylene esters, ethoxylated and glycol esters of fatty acids, and the like, carboxylic amides such as diethanolamine condensates, monoalkanolamine condensates, polyoxyethylene fatty acid amides, and the like; and polyalkylene oxide block copolymers including an ethylene oxide/propylene oxide block copolymer such as those commercially available under the trademark PLURONIC (BASF-Wyandotte), and the like; and other like nonionic compounds. Silicone surfactants such as ABIL B8852 can also be used.

Please replaces lines 20-29 of page 10 of the specification with the following paragraph:

Cationic surfactants useful for inclusion in a cleaning composition for sanitizing or fabric softening[[,]] include amines such as primary, secondary and tertiary monoamines with C_{18} alkyl or alkenyl chains, ethoxylated alklamines, alkoxylates of ethylenediamine, imidazoles such as a 1-(2-hydroxyethyl)-2-imidazoline, a 2-alkyl-1-(2-hydroxyethyl)-2-imidazoline, and the like; and the quaternary ammonium salts, as for example, alkylquaternary ammonium chloride surfactants such as n-alkyl(C_{12} - C_{18}) dimethylbenzyle ammonium chloride, n-tetradecyldimethylbenzylammonium chloride monohydrate, a naphthalene=substituted quaternary ammonium chloride such as dimethyl-1-naphthylmethylanmonium chloride, and the like; and other like cationic surfactants.

Please replace lines 2-31 of page 11 and lines 1-2 of page 12 of the specification with the following paragraph:

The composition can optionally include a rinse aid composition, for example, a rinse aid formulation containing a wetting or sheeting agent combined with other optional ingredients in a solid composition made using the binding agent. The rinse aid components of a solid rinse aid can be a water soluble or dispersible low foaming organic material capable of reducing the surface tension of the rinse water to promote sheeting actin and/or to prevent spotting or streaking caused by beaded water after rinsing is complete, for example in warewashing processes. Such sheeting agents are typically organic surfactant like materials having a characteristic cloud point. The cloud point of the surfactant rinse or sheeting agent is defined as the temperature at which a 1 wt. % aqueous solution of the surfactant turns cloudy when warmed. Since there are two general types of rinse cycles in commercial warewashing machines, a first type generally considered a sanitizing rinse cycle uses rinse water at a temperature in the range of about 180°F to about 80°C, or higher. A second type of non-sanitizing ~~machines~~ machine uses a lower temperature non-sanitizing rinse, typically at a temperature in the range of about 125° F to about 50° C[[,]], or higher. Surfactants useful in these applications are aqueous rinses having a cloud point greater than the available hot

service water. Accordingly, the lowest cloud point measured for the surfactants can be approximately 40°C. The cloud point can also be 60° C or higher, 70° C or higher, 80° C[[,]] or higher, etc., depending on the use locus hot water temperature and the temperature and type of rinse cycle. Some example sheeting agents can typically comprise a polyether compound prepared from ethylene oxide, propylene oxide, or a mixture in a homopolymer or block or heteric copolymer structure. Such polyether compounds are known as polyalkylene oxide polymers, polyoxyalkylene polymers or polyalkylene glycol polymers. Such sheeting agents require a region of relative hydrophobicity and a region of relative hydrophilicity to provide surfactant properties to the molecule. Such sheeting agents can have a molecular weight in the range of about 500 to 15,000. Certain types of (PO)(EO) polymeric rinse aids have been found to be useful containing at least one block of poly(PO) and at least one block of poly(EO) in the polymer molecule. Additional blocks of poly(EO), ~~poly PO~~ poly(PO) or random polymerized regions can be formed in the molecule. Particularly useful polyoxypropylene polyoxyethylene block copolymers are those comprising a center block of polyoxypropylene units and blocks of polyoxyethylene units to each side of the center block. Such polymers have the formula shown below:

Please replace lines 6-9 of page 12 of the specification with the following paragraph:

wherein m is an integer of 20 to 60, and each end (n) is independently an integer of 10 to 130. Another useful block copolymer are block copolymers having a center block of polyoxyethylene units and blocks of polyoxypropylene to each side of the center block. Such copolymers have the formula:



Please replace lines 13-18 of page 12 of the specification with the following paragraph:

wherein m is an integer of 15 to 175, and each end (n) is ~~[[are]]~~ independently an integer ~~integers~~ of about 10 to 30. The solid functional materials can often use a hydrotrope to aid in

maintaining the solubility of sheeting or wetting agents. Hydrotropes can be used to modify the aqueous solution creating increased solubility for the organic material. In some embodiments, hydrotropes are low molecular weight aromatic sulfonate materials such as xylene sulfonates and dialkyldiphenyl oxide sulfonate materials.

Please replace lines 21-31 of page 12 and lines 1-12 of page 13 of the specification with the following paragraph:

The composition can optionally include a bleaching agent. Bleaching agent agents can be used for lightening or whitening a substrate, and can include bleaching compounds capable of liberating an active halogen species, such as Cl_2 , Br_2 , $-\text{OCl}^-$ and/or $-\text{OBr}^-$, or the like, under conditions typically encountered during the cleansing process. Suitable bleaching agents for use can include, for example, chlorine-containing compounds such as a chlorine, a hypochlorite, chloramines, ~~[[of]]~~ or the like. Some examples of halogen-releasing compounds include the alkali metal dichloriosocyanurates, chlorinated trisodium phosphate, the alkali metal hypochlorites, monochloramine and dichloroamine, and the like. Encapsulated chlorine sources may also be used to enhance the stability of the chlorine source in the composition (see, for example, U.S. Pat. Nos. 4,618,914 and 4,830,773, the disclosures of which are incorporated by reference herein). A bleaching agent may also include an agent containing or acting as a source of active oxygen. The active oxygen compound acts to provide a source of active oxygen, for example, may release active oxygen in aqueous solutions. An active oxygen compound can be inorganic or organic, or can be a mixture thereof. Some examples of active oxygen ~~compound~~ compounds include peroxygen compounds, or peroxygen compound adducts. Some examples of active oxygen compounds or sources include hydrogen peroxide, perborates, sodium carbonate peroxyhydrate, phosphate peroxyhydrates, potassium permonosulfate, and sodium perborate mono and tetrahydrate, with and without activators such as tetraacetylene diamine, and the like. A cleaning composition may include a minor but effect amount of a bleaching agent, for example, in some embodiments, in the range of up to about 10 wt. %, and in some embodiments, in the range of about 0.1 to about 6 wt. %.

Please replace lines 29-31 of page 13 and lines 1-8 of page 14 of the specification with the following paragraph:

The given antimicrobial agent, depending on chemical composition and concentration, may simply limit further proliferation of ~~numbers of~~ the microbe or may destroy all or a portion of the microbial population. The terms "microbes" and "microorganisms" typically refer primarily to bacteria, virus, yeast, spores, and fungus microorganisms. In use, the antimicrobial agents are typically formed into a solid functional material that when diluted and dispensed, optionally, for example, using an aqueous stream forms an aqueous disinfectant or sanitizer composition that can be contacted with a variety of surfaces resulting in prevention of growth or the killing of a portion of the microbial population. A three log reduction of the microbial population results in a sanitizer composition. The antimicrobial agent can be encapsulated, for example, to improve its stability.

Please replace lines 9-24 of page 14 of the specification with the following paragraph:

Some examples of common antimicrobial agents include phenolic antimicrobials such as pentachlorophenol, orthophenylphenol, a chloro-p-benzylphenol, p-chlor-m-xylenol. Halogen containing antibacterial agents include sodium trichloroisocyanurate, sodium dichloro isocyanate (anhydrous or dihydrate), iodine-poly(vinylpyrrolidinone) complexes, bromine compounds such as 2-bromo-2-nitropropane-1,3-diol, and quaternary antimicrobial agents such as benzalkonium chloride, didecyldimethyl ammonium chloride, choline diiodochloride, tetramethyl phosphonium tribromide. Other antimicrobial compositions such as hexahydro-1, 3, 5-tris(2-hydroxyethyl)-s- -triazine, dithiocarbamates such as sodium dimethyldithiocarbamate, and a variety of other materials are known in the art for their antimicrobial properties. In some embodiments, the cleaning composition comprises sanitizing agent in an amount effective to provide a desired level of sanitizing. In some embodiments, an antimicrobial component, such as TAED can be included in the range of up to about 75 % by wt. Of the composition, [[,]] in some embodiments in the range of up to about 20 wt.

%, or in some embodiments, in the range of about 0.01 to about 20 wt. %, or in the range of 0.05 to 10% by wt of the composition.

Please replace lines 8-12 of page 15 of the specification with the following paragraph:

In some embodiments, an activator component can include in the range of up to about 75% by wt. Of the composition, in some embodiments, in the range of about 0.01 to about 20% by wt[[,]]. of the composition, or in some embodiments, in the range of about 0.05 to 10% by wt. of the composition. In some embodiments, an activator for an active oxygen compound combines with the active oxygen to form an antimicrobial agent.

Please replace lines 13-20 of page 15 of the specification with the following paragraph:

In some embodiments, the composition includes a solid block[[,]] and an activator material for where the active oxygen is coupled to the solid block. The activator can be coupled to the solid block by any of a variety of methods for coupling one solid cleaning composition to another. For example, the activator can be in the form of a solid that is bound, affixed, glued or otherwise adhered to the solid block. Alternatively, the solid activator can be formed around and encasing the block. By way of further example, the solid activator can be coupled to the solid block by the container or package for the cleaning composition, such as a plastic or shrink wrap or film.

Please replace lines 25-31 of page 16 and lines 1-3 of page 17 of the specification with the following paragraph:

The composition can optionally include an optical brightener. An optical brightener is also referred to as fluorescent whitening agents or fluorescent brightening agents and can provide optical compensation for the yellow cast in fabric substrates. With optical brighteners, yellowing is replaced by light emitted from optical brighteners present in the area commensurate in scope with yellow color. The violet to blue light supplied by the optical brighteners combines with other light

reflected from the location to provide a substantially complete or enhanced bright white appearance. This additional light is produced by the brightener through fluorescence. Optical brighteners absorb light in the ultraviolet range 275 through 400 nm. and emit light in the ultraviolet blue spectrum range 400-500 nm.

Please replace lines 4-19 of page 17 of the specification with the following paragraph:

Fluorescent compounds belonging to the optical brightener family are typically aromatic or aromatic heterocyclic materials often containing a condensed ring system. A feature of these compounds is the presence of an uninterrupted chain of conjugated double bonds associated with an aromatic ring. The number of such conjugated double bonds is dependent on substituents as well as the planarity of the fluorescent part of the molecule. Most brightener compounds are derivatives of stilbene or 4,4'-diamino stilbene, biphenyl, five membered heterocycles (triazoles, oxazoles, imidazoles, etc.) Or six membered heterocycles (cumarins, naphthalamides, triazines, etc.). The choice of optical brighteners for use in compositions will depend upon a number of factors, such as the type of composition, the nature of other components present in the composition, the temperature of the wash water, the degree of agitation, and the ratio of the material washed to the tub size. The brightener selection is also dependent upon the type of material to be cleaned, e.g., cottons, synthetics, etc. Since most laundry detergent products are used to clean a variety of fabrics, the detergent compositions may contain a mixture of brighteners which are effective for a variety of fabrics. It is of course necessary that the individual components of such a brightener mixture be compatible.

Please replace lines 2-10 of page 18 of the specification with the following paragraph:

Various dyes[[,]] and/or odorants including perfumes, and other aesthetic enhancing agents may also be included in the composition. Dyes may be included to alter the appearance of the composition, as for example, Direct Blue 86 (Miles), Fastsol Blue (Mobay Chemical Corp.), Acid Orange 7 (American Cyanamid), Basic Violet 10 (Sandoz), Acid Yellow 23 (GAF), Acid Yellow 17

(Sigma Chemical), Sap Green (Keyston Analine and Chemical), Metanil Yellow (Keystone Analine and Chemical), Acid Blue 9 (Hilton Davis) Sandolan Blue/Acid Blue 182 (Sandoz), Hisol Fast Red (Capitol Color and Chemical), Fluorescein (Capitol Color and Chemical), Acid Green 25 (Ciba-Geigy), and the like.

Please replace lines 16-26 of page 18 of the specification with the following paragraph:

A ~~compositions~~ composition may include a minor but effective amount of a secondary hardening agent, as for example, an amide such as stearic monoethanolamide or lauric diethanolamide, or an alkylamide, and the like; a solid polyethylene glycol, or a solid EO/PO block copolymer, and the like; starches that have been made water-soluble through an acid or alkaline treatment process; various inorganics that impart solidifying properties to a heated composition upon cooling, and the like. Such compounds may also vary the solubility of the composition in an aqueous medium during use such that the cleaning agent and/or other active ingredients may be dispensed from the solid composition over an extended period of time. The composition may include a secondary hardening agent in an amount in the range of up to about 20 wt[[-]]%, or in some embodiments, in the range of about 5 to about 15 wt[[-]]%.

Please replace lines 13-16 of page 19 of the specification with the following paragraph:

A wide variety of other ingredients useful in providing the particular composition being formulated to include desired properties or functionality may also be included. For example, the compositions, may include other active ingredients, pH buffers, cleaning ~~enzyme~~ enzymes, carriers, processing aids, solvents for liquid formulations, or others, and the like.

Please replace lines 23-29 of page 21 of the specification with the following paragraph:

Optionally, heating and cooling devices may be mounted adjacent to a mixing apparatus to apply or remove heat in order to obtain a desired temperature profile in the mixer. For example, an external source of heat may be applied to one or more barrel sections of the mixer, such as the ingredient inlet section, the final outlet section, and the like, to increase fluidity of the mixture during processing. In some embodiments, the temperature of the mixture during processing, including at the discharge port, is maintained in the range of about 20° C to about 90° C.

Please replace lines 30-31 of page 21 and lines 1-7 of page 22 of the specification with the following paragraph:

When processing of the ingredients is completed, the mixture may be discharged from the mixer through a discharge die. The composition eventually hardens due to the chemical reaction of the ingredients forming the binder agent. The solidification process may last from a few minutes to about six hours, or more, depending, for example, on the size of the cast or extruded composition, the ingredients of the composition, the temperature of the composition, and other like factors. In some embodiments, the cast or extruded composition "sets up" or begins to ~~hardens~~ harden to a solid form within about 1 minute to about 3 hours, or in the range of about 1 minute to about 2 hours, or in some embodiments, within about 1 minute to about 20 minutes.

Please replace lines 14-21 of page 22 of the specification with the following paragraph:

Advantageously, in at least some embodiments, since the composition is processed at or near ambient temperatures, the temperature of the processed mixture is low enough so that the mixture may be cast or extruded directly into the container or other packaging system without structurally damaging the material. As a result, a wider variety of materials may be used to manufacture the container than those used for compositions that are processed and dispensed under

molten conditions. In some embodiments, the packaging used to contain the compositions is manufactured from a flexible, easy opening film material.

Please replace lines 4-12 of page 26 of the specification with the following paragraph:

After formation of the solid compositions, the following initial observations were made: All of the formulations produced a solid tablet. The control formulation and formulations A and E produced a hard tablet with some surface cracking. Formulation B produced a hard tablet with some surface cracking, but that was a little more tacky than the control. Formulation C produced a solid tablet that had larger particle size during mixing, and was somewhat softer than the control, but had no surface cracking. Formulation D produced a solid tablet that [[D]] was a little harder and dryer than the control, and was easier to break than the control. Formulation F produced a hard tablet with no surface cracking.

Please replace lines 13-18 of page 26 of the specification with the following paragraph:

One day after [[the]] extruding the tablets using the formulations listed above, penetrometer readings were taken on some of the samples using a Precision Scientific 626A penetrometer with 150g weights on the needle. The tablets were tested by deflecting the unit for five seconds, and then measuring the penetration value. A value of 1 indicates a penetration of 0.1 millimeters. These penetrometer readings indicate solidification and the formation of a hard tablet. The results are shown in Table 4.

Please replace lines 13-18 of page 32 and lines 1-10 of page 33 of the specification with the following paragraph:

Each of the formulations [[were]] was created using a 30 millimeter Werner-Pfleider extruder assembly. The two different feed streams fed into the extruder which included a series of conveying screws and one mixing screw near the end of the extruder. For formulation O, which

included a feed rate of 7.5% HEDTA, the first feed stream was at a rate of 0.65 pounds per minute, and the second feed stream was set at a rate of 0.05 pounds per minute. For formulation P, which included a feed rate of 15% HEDTA, the first feed stream was at a rate of 0.65 pounds per minute, and the second feed stream was set at a rate of 0.10 pounds per minute. For formulations Q, which included a feed rate of 25% HEDTA, the first feed stream was at a rate of 0.65 pounds per minute, and the second feed stream was set at a rate of 0.18 pounds per minute. The extruder was set to run at 200 rpm. For each of the formulations, the feed streams were mixed in the extruder, and the mixed composition was conveyed out the end of the extruder into the die section where the semi-solid product was shaped into a desired form. The ~~[[dye]] die~~ and barrel of the extruder were set up with heating and/or cooling mechanisms. During extrusion, the ~~[[dye]] die~~ was maintained at a temperature of about 185° F. After extrusion through the ~~[[dye]] die~~, the shaped product was allowed to solidify.

Please replace lines 23-31 of page 33 of the specification with the following paragraph:

In this example, two formulations were made, one including water and HEDTA and another including methanol and HEDTA. The first formulation included 93% by wt. HEDTA and 7% by wt. Water, and was created by admixing the HEDTA and water in the correct wt. % in a specimen cup. The composition was mixed for about 30 to 45 seconds. It was noted during mixing that the composition progressively got harder as the mixing progressed. The formulation was then allowed to stand for 10 minutes, at which time it was found to have solidified to produce a solid tablet. The composition was ~~allowed~~ allowed to stand overnight in a sealed specimen cup. The next morning, the solid tablet was popped out of the specimen cup.